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GGSIPU chemistry 2009

1. Increasing order (lowest first) for the values of e/m for electro (e),proton (p),neutron (n) and ~-particles is

(a) e,p,n,~ (b) n,~,p,e

(c) n,p,e,~ (d) n,p,~,e

2. A particle moving with a velocity 10^6 m/s will have de-Broglie wavelength nearly

[Given, m = 6.62×10^{27} kg, h=6.62×10^{-34} J-s]

(a) 10^{-9}
(b) 10^{-13}
(c) 10^{-19}
(d) 1 Å

3. Bohr's radius of 2^{nd} orbit of Be^{3+} is equal to that of

(a) 4^{th} orbit of hydrogen

(b) 2^{nd} orbit of He^{+}

(c) 3^{rd} orbit of Li^{2+}

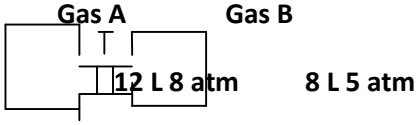
(d) first orbit of hydrogen

4. Half-life period of a radioactive element is 100 yr.How long will it take for its 93.75% decay ?

(a) 400 yr (b) 300 yr

(c) 200 yr (d) 193 yr

5. Two vessels containing gases A and B are interconnected as shown in the figure.The stopper is opened,the gases are allowed to mix homogeneously .The partial pressures of A and B in the mixture will be, respectively



(a) 8 and 5 atm
(b) 9.6 and 4 atm
(c) 4.8 and 2 atm

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(d) 6.4 and 4 atm

6. The temperature, at which a gas shows maximum ideal behavior,is known as

(a) Boyle's temperature

(b) inversion temperature

(c) critical temperature

(d) absolute temperature

7. The unit of rate constant of a second order reaction is

(a) mol/L-s

(b) L/mol-s

(c) L^2/mol^2-s

(d) per second

8. $2N_2O_5 \rightleftharpoons 4NO_2 + O_2$

For the above reaction which of the following is not correct about rates of reaction ?

(a) $\frac{-d[N_2O_5]}{dt} = 2\frac{d[O_2]}{dt}$

(b) $\frac{-2d[N_2O_5]}{dt} = \frac{d[NO_2]}{dt}$

(c) $\frac{d[N_2O_5]}{dt} = 4\frac{d[O_2]}{dt}$

(d) $\frac{-2d[N_2O_5]}{dt} = 4\frac{d[NO_2]}{dt} = \frac{d[O_2]}{dt}$

9. A+B ⟶ Product

If concentration of A is doubled, rate increases 4 times. If concentrations of A and B both are doubled ,rate increases 4 times. If concentrations of A and B both are doubled, rate increases 8 times. The differential rate equation of the reaction will be

(a) $\frac{dC}{dt} = kC_A \times C_B$ (b) $\frac{dC}{dt} = kC_A^2 \times C_B^3$

(c) $\frac{dC}{dt} = kC_A^2 \times C_B$ (d) $\frac{dC}{dt} = kC_A^2 \times C_B^2$

10. Which of the following is a wrong statement about equilibrium state ?

(a) Rate of forward reaction = Rate of backward reaction

(b) Equilibrium is dynamic

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(c) Catalysis increase value of equilibrium constant

(d) Free energy change is zero

11. A+B ⇌ C+D Initially moles of A and B are equal.At equilibrium ,moles of C are three times that of A.The equilibrium constant of the reaction will be

(a) 1 (b) 3 (c) 4 (d) 9

12. If for $N_2+3H_2 \rightleftharpoons 2NH_3$, K_{eq} for the reaction $NH_3 \rightleftharpoons \frac{1}{2}N_2 + \frac{3}{2}H_2$ will be

(a) 6.25 (b) 25 (c) 250 (d) 500

13. A weak acid HX has dissociation constant 10^{-5} . The pH of 0.1 M solution of this acid will be

(a) 2 (b) 3 (c) 4 (d) 5

14. Which of the following is not a buffer solution ?

(a) 100 mL 0.1 M CH_3COOH + 50 mL 0.1 M CH_3COONa

(b) 100 mL 0.1 M CH_3COOH + 50 mL 0.1 M NaOH

(c) 50 mL 0.1 M CH_3COOH + 100 mL 0.1 M NaOH

(d) 100 mL: 0.1 M NH_4OH + 50 mL 0.1 M HCL

15. If K_{sp} of Ag_2S is 10^{-17}, the solubility of Ag_2S in 0.1 M solution of Na_2S will be

(a) 10^{-8} (b) $5x10^{-9}$

(c) 10^{-15} (d) 10^{-16}

16. Which of the following has the highest solubility product ?

(a) CuS (b) Bi_2S_3

(c) CdS (d) ZnS

17. The pH values of 0.1 solution of HCL, CH_3COOH, NH_4CL and CH_3COONa will have the order

(a) HCL<CH_3COOH<NH_4CL<CH_3COONa

(b) CH_3COONa<NH_4CL<CH_3COOH<HCL

(c) NH_4CL<CH_3COONa<CH_3COOH<HCL

(d) All will have same pH value

18. For the titration of solution of oxalic acid and sodium hydroxide, the suitable indicator is

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(a) phenolphthalein

(b) methyl orange

(c) any of these

(d) None of these

19. If 'F' is faraday and 'N' is Avogadro number, then charge of the4 electron can be expressed as

(a) FxN (b) $\frac{F}{N}$

(c) $\frac{N}{F}$ (d) F^2N

20. By passing 9.65 A current for 16 min 40 s, the volume of O_2 liberated at STP will be

(a) 280 mL (b) 560 mL

(c) 1120 mL (d) 2240 mL

21. By diluting a weak electrolyte, specific conductivity (K_c) and equivalent conductivity ($^a{}_c$) change as

(a) both increase

(b) K_c increases , $^a{}_c$ decreases

(c) K_c decreases, $^a{}_c$ increases

(d) both decrease

22. In daniel cell, anode and cathode are respectively

(a) $Zn^0 Zn^{2+}$ and $Cu^{2+} {}^0 Cu$

(b) $Cu^0 Cu^{2+}$ and $Zn^{2+} {}^0 Zn$

(c) $Fe^0 Fe^{2+}$ and $Cu^{2+} {}^0 Cu$

(d) $Cu^0 Cu^{2+}$ and $Fe^{2+} {}^0 Fe$

23. $C_2H_2 + \frac{5}{2}O_2 \rightarrow 2CO_2 + H_2O$;

aH = -310 kcal

$C + O_2 \rightarrow CO_2$; aH = -94 kcal

$H_2 + \frac{1}{2}O_2 \rightarrow H_2O$; aH = -68 kcal

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On the basis of the above equations, ΔH_f (enthalpy of formation) of C_2H_2 will be

(a) -148 kcal (b) +54 kcal

(c) -54 kcal (d) +80 kcal

24. $I_2(s) \rightleftharpoons I_2(g)$; $\Delta H = +40$ kcal, $\Delta S = 80$ cal. The sublimation point of $I_2(s)$ will be

(a) 100^0C (b) 127^0 C

(c) 227^0 C (d) 500^0 C

25. If 0.1 M solutions of each electrolyte are taken and if all electrolytes are completely dissociated, then whose boiling point will be highest?

(a) Glucose (b) KCL

(c) $BaCL_2$ (d) $K_4[Fe(CN)_6]$

26. A solid metal has ccp or fcc structure. The relation of side of cube (a) and redius of atom (r) will be

(a) $a=2r$ (b) $a=2\sqrt{2}\,r$

(c) $a=\frac{4}{\sqrt{3}}r$ (d) $a=\sqrt{\frac{3}{2}}r$

27. Hydrogen is prepared on large scale for industrial use

(a) by $Zn+H_2SO_4$ (b) by Al+NaOH

(c) by $Na+C_2H_5OH$ (d) from water gas

28. Which of the following properties of lithium does not show diagonal relationship with magnesium ?

(a) Formation of Li^+ ion

(b) Formation of Li_3N

(c) Solubility of $LiHCO_3$

(d) Thermal decomposition of Li_2CO_3

29. Which of the following carbonates decomposes at lowest temperature?

(a) $MgCO_3$ (b) $CaCO_3$

(c) $SrCO_3$ (d) $BaCO_3$

30. In which of the following pairs both molecules do not possess same type of hybridization?

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(a) CH_4 and H_2O (b) PCL_5 and SF_4

(c) SF_6 and XeF_4 (d) BCL_3 and NCL_3

31. If H—X bond length is 2.00 $\AA$ and H—X bond has dipole moment 5.12×10^{-30} C-m,the percentage of ionic character in the molecule will be

(a) 10% (b) 16% (c) 18% (d) 20%

32. (i) H—C—H angle in CH_4

(ii) CL—B—CL angle in BCL_3

(iii) F—I—F angle in IF_7 in a plane

(iv) I—I—I angle in I^-_3

Increasing order of above bond angles is

(a) (i)<(ii)<(iii)<(iv)
(b) (ii)<(i)<(iii)<(iv)
(c) (iii)<(i)<(ii)<(iv)
(d) (iv)<(ii)<(i)<(iii)

33. According to molecular orbital theory, bond order in increasing order will be

(a) $O^{2+}_2 < O_2 < O_2^- < O^{2-}_2$

(b) $O^{2-}_2 < O_2^- < O_2 < O^{2+}_2$

(c) $O_2 < O^{2-}_2 < O_2^- < O^{2+}_2$

(d) $O_2 < O^{2+}_2\ O_2^- < O^{2-}_2$

34. Correct order electron affinities of halogens is

(a) F>CL>Br>I (b) I>Br>CL>F

(c) CL>F>I>Br (d) CL>F>Br>I

35. Atomic radii of Ti, Zr and Hf vary

(a) Ti>Zr>Hf (b) Ti<Zr<Hf

(c) Ti<Hf<Zr (d) Ti<Zr=HF

36. If $NO_2(N_2O_4)$ is dissolved in NaOH,we get solution of

(a) $NaNO_2$

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(b) $NaNO_3$

(c) mixture of $NaNO_2$ and $NaNO_3$

(d) $NaNO_4$

37. A gas that religts glowing splinter,is

(a) H_2 (b) O_2

(c) N_2 (d) NO_2

38. A white-coloured inorganic compound, on heating,gives a gas which turns lime water milky and residue is left which is yellow when hot and turns white and cooling. The compound is

(a) $pb(NO_3)_2$ (b) $pbCO_3$

(c) $BaCO_3$ (d) $ZnCO_3$

39. Buckminster-fullerebe is a variety of

(a) boron (b) carbon

(c) ammonia (d) fluorine

40. What will be the compound if two valencies of carbonyl group are satisfied by two alkyl groups?

(a) Aldehyde (b) Ketone

(c) Acid (d) Acidic anhydride

41. 2-chloro-3-methylbutane is treated with sodium in enerial solution,then it will give

(a) 2,4-dimethylhexane

(b) 3,5- dimethylhexane

(c) 2,3,4,5-tetramethylhexane

(d) 2,6-dimethyloctane

42. C_2H_5CL+aq NaOH $\rightarrow$ C_2H_5OH + NaCL; this reaction is

(a) electrphilic substitution of I order

(b) electrophilic substitution of II order

(c) nucleophilic substitution of I order

(d) nucleophilic substitution of II order

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43. Which of the following does not contain chiral carbon atom?

(a) Lactic acid (b) 2-chlorobutanoic acid

(c) Tartaric acid (d) Succinic acid

44. An organic on reuctive ozonolysis produces

(i) acetaldehyde

(ii) acetone

(iii) 2-methylprpane-1.3-dial

The formula of alkadiene will be

(a) $CH_3C = CHCHCH = CHCH_3$

O O

CH_3 CH_3

(b) $CH_3CHCH = CCH = CHCH_3$

O O

CH_3 CH_3

(c) $CH_3C = CHCHC = CHCH_3$

O O

CH_3 CH_3

(d) $CH_3CH_2CHCH = CHC = CH_2$

O O

CH_3 CH_3

45. Which of the following acids will have lowest value of pK_a ?

(a) CH_3CH_2COOH (b) $CH_3CHCOOH$

O

Br

(c) $CH_3CHCOOH$ (d) FCH_2CH_2COOH

O

F

46. Which of the following will not respond to iodoform test ?

(a) Ethyl alcohol (b) propanol-2

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(c) Propanol-1 (d) Ethanal

47. The strongest ortho/para directing group is

(a) $-NH_2$ (b) $-CH_3$

(c) $-CL$ (d) $-C_2H_5$

48. Which of the following reaction can be used to change benzaldehyde to cinnamic acid?

(a) perkin reaction (b) Knoevenagle reaction

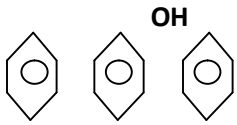
(c) Reformatsky reaction (d) Benzoin condensation

49. Which of the following is strongest base ?

(a) $C_6H_5NH_2$ (b) p- NO_2 $-C_6H_4NH_2$

(c) m-NO_2 $-C_6H_4NH_2$ (d) $C_6H_5CH_2NH_2$

50. Correct acidic order of the following compounds is



(i) (ii) (iii)

(a) I>ii>iii
(b) Iii>i>ii
(c) Ii>iii>i
(d) 1>iii>ii

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